NOTES.

THE Admiralty has, we believe, specially set apart the *Triton* for the use of the scientific branch of the Navy and of men of science at the approaching naval review. It was obviously right that this arrangement should be made, and the Admiralty is to be congratulated on having declined to follow the bad example set by the Lord Chamberlain in connexion with the ceremony in Westminster Abbey.

M. PASTEUR having consented to become a candidate for the office of Perpetual Secretary of the Paris Academy of Sciences, the other candidates have withdrawn their applications, and he will of course be elected unanimously.

THE Committee for the erection of a statue to Francois Arago, in Paris, on the Place St. Jacques, near the Observatory, held a meeting the other day at the Observatory, Admiral Mouchez in the chair. It was decided that the subscription should be closed on December 31 next. Although the majority of the lists have not yet been returned, it is already known that not less than £700 has been collected. An appeal will be addressed by M. Mouchez to admirers of the celebrated astronomer.

THE Congress of the International Astronomical Society will be held at Kiel from August 29 to September 1.

AT the half-yearly general meeting of the Scottish Meteorological Society, held on Monday, it was intimated that the subscriptions obtained for the Ben Nevis Observatory since the beginning of January last now amount to £1115.

MR. H. H. JOHNSTON, H.B.M. Consul for the Cameroons district of West Africa, has sent home to this country, through the Foreign Office, the collections of natural history objects made during his recent excursion into the Rio del Rey district, a swampy region lying near the base of the Cameroons Mountains, in which it was at one time reported that Mr. Johnston had been taken prisoner and held in captivity by the natives. The collections have been placed by Mr. Sclater in the hands of various specialists to be reported upon. They are not very numerous, and will not probably contain many novelties, as much of the surrounding district has been well explored. But Capt. Shelley has already discovered amongst the birds two examples of a fine new species of plover, which will be described in the next number of the *Ibis* as *Sarciophorus seebohmi*. This plover is remarkable for its rufous forehead, black crown, and chocolate coloured crop, which render it easily distinguishable from its congeners. There is likewise among the mammals an example of a small shrew new to science, which Mr. Dobson will describe at the next meeting of the Zoological Society, and dedicate to its discoverer.

AN important botanical periodical is about to be issued by the Delegates of the Clarendon Press. It will be entitled *Annals of Botany*, and will be edited by Prof. Bayley Balfour, of the University of Oxford; by Dr. Vines, Reader in Botany in the University of Cambridge; and by Prof. W. G. Farlow, of Harvard University, Massachusetts, U.S.A. The papers, adequately illustrated, will be on subjects pertaining to all branches of botanical science, including morphology, histology, physiology, palæobotany, pathology, geographical distribution, economic botany, and systematic botany and classification. There will also be articles on the history of botany, reviews and criticisms of botanical works, reports of progress in the different departments of the science, short notes, and letters. A record of botanical works in the English language will be a special feature. With regard to the last point, the editors direct attention to the fact that many important contributions to botanical science are not at present brought before the botanical world with that promptitude which their merit deserves, and many are frequently entirely overlooked, owing to the fact that the periodical in which they appear is not readily accessible to botanists generally. An attempt will be made in the *Annals of Botany* to remedy this state of affairs; and it is hoped that it may be possible to make the record fairly complete, embracing works published not only in Great Britain and Ireland, but also in India and the colonies, and in America. To enable them to carry out this intention, the editors appeal to the Secretaries of local Scientific Institutions, Societies, and Clubs, in all parts of the world, to send them early information of the publication of papers relating to botany in any of its branches.

DURING the months of March, April, and May, Prof. Paul Ascherson, of the Berlin University, carried on botanical researches on the coast of Egypt. He has found a surprising number of plants that were formerly unknown. Special interest attaches to the results obtained by him on the coast between the Suez Canal and the Syrian frontier.

THE Berlin Academy of Sciences has granted 900 marks (£45) to Dr. Ravitz (Naples) for the continuation of his researches on the central nervous system of Acephala; 3000 marks (£150) to Prof. Nussbaum (Bonn) for a zoological expedition to San Francisco and investigations on the division of organisms; 600 marks (£30) to Dr. Otto Zacharias (Hirschberg) for the continuation of his studies on the fauna of the North German lakes; and 1200 marks (£60) to Dr. Karl Schmidt for a geological expedition to the Pyrenees.

WE are glad to notice that the Council of the Recreative Evening Schools' Association, through one of their Committees, are organizing a system of elementary instruction in many branches of natural science, to come into operation next season in the London Board schools. These evening classes are held from September or October until April or May, and last winter the Association carried on its operations in eighty of the London Board schools, and hopes to do so in at least 100 next winter. The classes are intended for the continuation of the training of young people between the ages of fourteen and eighteen, who have left the day Board schools. About 80,000 such leave the London schools alone every year, and hitherto not 5 per cent. of them have continued their education. The science teaching is intended to be carried out mainly by lantern demonstrations, and the Committee (among whom we observe the names of Prof. Jeffrey Bell, Mr. F. W. Rudler, Mr. W. Lant Carpenter, Mr. J. Harris Teall, and others) are anxious to obtain the voluntary services of young scientific men, who may be willing to help so good a cause by undertaking to give courses of ten or twelve very elementary lectures, of a thoroughly popular but educational kind, on various scientific subjects. The expenses of lantern, slides, &c., will be borne by the Association. It is intended that the lectures shall be once a week, and shall not exceed forty-five minutes in length. Circulars have been freely sent to the various centres of scientific teaching in London inviting the co-operation of students and others, and further information can be obtained from any member of the "Science Committee" of the Association, or from its Secretary, Mr. J. E. Flower, 37 Norfolk Street, Strand. We are also informed that the Gilchrist Trustees have generously expressed their intention of spending £100 on lanterns and slides for the use of the Association.

A WELL-EQUIPPED technical school for Preston and the neighbourhood is about to be erected and endowed. A grant of £30,000 has been made for the purpose to the Council of the Harris Institute, Preston, by the trustees under the will of the late Mr. E. R. Harris, who left nearly half a million sterling for philanthropic objects in Preston. The site for the school has been given by the Preston Corporation. In the prospectus just issued by the Council of the Institute it is estimated that the cost of the building, furniture, and fittings will not be less than £17,000, of which they are allowed to provide £10,000 out of the grant, the remaining £20,000 being held as an endowment fund. The Council intend that instruction shall be given in all the branches of cotton-spinning, weaving, and designing, mechanical engineering, and the building-trades in general, both in day and night classes. The school will be called the Victoria Jubilee Technical School.

THE Chair of Civil Engineering in the University of Dublin has been filled by the appointment of Prof. Thomas Alexander, who recently returned from Japan after having held the Professorship of Civil Engineering in the Imperial College of Engineering, Tokio, for seven years. Mr. Alexander is the author of several valuable papers on engineering subjects, and has given some new theorems in graphic statics which have been adopted both in English and Continental works on that subject. He is also, jointly with Mr. Arthur W. Thomson, author of a work on elementary applied mechanics.

IN the latest number of the *Zeitschrift für physikalische Chemie* will be found complete details of the classical work of Drs. Krüss and Nilson, briefly announced three weeks ago in the *Berichte*, upon the vapour-density of thorium chloride, which finally sets at rest the controversy as to the valency and position in the natural system of thorium. From a consideration of the physical constants, and the fact that the oxide is isomorphous with the oxides of titanium, zirconium, and tin, thorium was generally supposed to be tetravalent, forming an oxide, ThO_2, and a chloride, $ThCl_4$; moreover, an element of atomic weight 232, having these properties and belonging to the tetravalent series, was required from theoretical considerations based on the assumption of the truth of the periodic law. But, unfortunately, confusion was introduced into all this harmony by the matter-of-fact announcement by no less an authority than Troost that the vapour-density of the chloride had been determined by him to correspond to the formula $ThCl_2$. This, however, meant a divalent thorium of atomic weight 116, for which no place exists in the periodic table. Krüss and Nilson, in their endeavours to get at the truth of this matter, have utilized a quantity of pure thorium, which they had prepared for atomic-weight determinations, by converting it into the chloride, pure colourless prisms of which were eventually obtained by resublimation in a platinum tube. The determination of its vapour-density was then carried out in a platinum vessel and in an atmosphere of carbon dioxide, with the satisfactory result that at temperatures varying from 1102° to 1140°, just above the point of volatilization, the vapour-density corresponds to a formula of $ThCl_4$, while above this temperature the chloride dissociates into free chlorine and a lower chloride. This proves decisively that thorium is tetravalent, and demonstrates the accuracy of results deduced from physical constants. To complete this splendid work, which bears great similarity to the famous work of Nilson and Pettersson on beryllium, the Swedish chemists have redetermined the atomic weight of thorium, which, in the light of their vapour-density determinations, they find to be 231·87.

THE Annual Report of the Chief Signal Officer of the United States Army for the year 1885 has now reached this country. It consists of two volumes: the first contains the usual meteorological results and notices of the works in progress; the second part, a volume of 440 pages (Washington, 1886), is a treatise by Dr. W. Ferrel on the recent advances in meteorology. As might be expected from Dr. Ferrel's works on the "Mechanics and General Motions of the Atmosphere," the subject is not treated in a very elementary manner. In fact, it is stated in the preface that the object has been to select from the material on hand some of the more important principles, methods, and results arrived at, mostly during the last quarter of a century, and to present them in the form of a text-book of the higher meteorology. No descriptions of meteorological instruments are given, as the Report states that this subject will be treated of in a separate work, by Prof. Cleveland Abbe. We refrain from making any comments here on Dr. Ferrel's treatise, further than that it supplies a want that has been much felt by students who have mastered the usual elementary text-books.

VOLUMES 28–30 of the miscellaneous collections published by the Smithsonian Institution (Washington, 1887) contain much valuable matter which should be widely known, viz.:—(1) A fourth edition of Dr. Guyot's meteorological and physical tables, the third edition of which was published more than a quarter of a century ago. Many useful tables have been added, mostly geographical and miscellaneous, but the meteorological tables have generally been reprinted unchanged, and are much behind the present requirements of the science. (2) A catalogue of the principal independent scientific and technical periodicals published in all countries from the earliest times to the close of the year 1882, giving full titles, sequence of series, and other bibliographical details. (3) The scientific writings of the late Joseph Henry, formerly Secretary of the Smithsonian Institution, including his contributions to various Societies and some previously unpublished papers, embracing a period of fifty-five years. This work is divided into two parts, the first containing miscellaneous, and the second meteorological papers.

PROF. SHALER'S article on tornadoes and cyclones in *Scribner's Magazine* for August will contain reproductions of two instantaneous photographs of a tornado which passed over Jamestown, Dakota, on June 6, 1887. The publishers had made a special search for negatives of storms, and given notice of it to many Western photographers. This fortunate opportunity occurred after the article was already in type.

THE "Admiralty Manual of Scientific Inquiry" is such a well-known book, that we need only state the names of the eminent men who have brought the fifth edition, which we have just received, up to date. Astronomy by Sir G. B. Airy, K.C.B., ex-Astronomer-Royal; Hydrography by Capt. W. J. L. Wharton, R.N., Hydrographer of the Admiralty; Tides by Prof. George H. Darwin; Terrestrial Magnetism by Prof. George F. Fitzgerald, assisted by Staff-Commander Creak, R.N., and Mr. G. M. Whipple, Superintendent of the Observatory; Meteorology by Mr. Robert H. Scott, Secretary of the Meteorological Council; Geography by General Sir Henry Lefroy, R.A.; Anthropology by Mr. E. B. Tylor; Statistics by Prof. C. F. Bastable; Medical Statistics by Mr. William Aitken; Geology by Prof. Arch. Geikie; Mineralogy by Prof. W. J. Sollas; Seismology by Mr. Thomas Gray; Zoology by Prof. H. N. Moseley; Botany by Sir J. D. Hooker. About half of the book has been entirely re-written; the arrangement of the present edition being substantially the same as that of former ones. No doubt our men-of-war will by-and-by be used very much more as floating laboratories and observatories than they are at present. When this is done both science and the naval service will be great gainers, and we know of no better means towards such an end than the efficient use of this magnificent compendium published in accordance with the laws of the Admiralty.

"PIONEERING in New Guinea," by the Rev. James Chalmers, contains some very valuable sketches of travels and labours in New Guinea during the years 1878–86. Mr. Chalmers explains that "his hand takes more readily to the tiller than to the pen." Hence he has made no effort to "work up" the contents of his journals into "a finished book," but has been content for the most part to present them exactly as they were written. The book is all the more likely to be appreciated on that account, for it has a freshness and vividness which it could scarcely have possessed if it had sprung less directly from the author's experience. Mr. Chalmers points out that succeeding missionaries and observers can never see the people of New Guinea in the stage of savagery in which he found them when he first went to the island. This gives, of course, a peculiar interest to the record of his impressions. The work contains a map and illustrations, and is published by the Religious Tract Society.

WE have received the first eight numbers of "British Dogs" by H. Dalziel (Upcott Gill). The book will supply admirers of the dog with a trustworthy guide, and it provides in an accessible form much information that will be of service to professionals, as well as to amateurs. The descriptions and plates, with slight exceptions, are very good.

PROF. AYRTON'S "Practical Electricity" is being translated into the German and Spanish languages.

THE tenth volume, lately published, of the series entitled "Monographs of the United States Geological Survey," contains a full account, by Prof. O. C. Marsh, of the Dinocerata, an extinct order of gigantic mammals discovered in the Eocene deposits of Wyoming Territory. The work is admirably illustrated.

THE New York Industrial Education Association will begin in the autumn the publication of a series of educational monographs under the editorship of the President of the Association, Dr. Butler. According to *Science*, the papers will treat of various educational topics, historically and critically; and some of the most influential educators, both in America and in Europe, have promised contributions. It is expected that the first monograph will be from the pen of President Gilman, of the Johns Hopkins University. The arguments in favour of industrial education and statements as to its proper organization and development will occupy a prominent place in the series, but not at all to the exclusion of other topics.

ON Friday, the 15th inst., a students' *conversazione* will be held at the Technical College, Finsbury. There will be a concert and exhibition, and lectures on "Church Bells" and "Spectrum Analysis" will be delivered, the former by Prof. Ayrton, F.R.S., the latter by Prof. Meldola, F.R.S. A demonstration on "The Use of the Secohmmeter" will be given by Mr. W. E. Sumpner.

IN 1880 the Midland Union of Natural History and other Scientific Societies founded the Darwin Medal for the purpose of encouraging original research by members of the Societies forming the Union. The medal is a handsome one, the dies for which were engraved by Mr. Joseph Moore, of Birmingham. On the obverse is the bust of Darwin, and on the reverse a branch of coral, commemorative of one of the most famous of his researches. The subjects for which the medal is awarded are geology, zoology, botany, and archæology. This year it was set apart for archæology, and at the annual meeting of the Midland Union of Natural History Societies, held last week at Malvern, it was awarded to Mr. Edward W. Badger, of King Edward's High School, Birmingham, for a paper on "The Monumental Brasses of Warwickshire."

THE second German Fishery Meeting will be held at Freiburg in Baden on July 29 and 30. An excursion to the Imperial Piscicultural Establishment at Hüningen (Alsace) will be made. All inquiries are to be directed to the German Fishery Society, Leipzigerplatz 9, Berlin.

THE Deutsche Seewarte has issued a second edition of its ice chart (see NATURE, vol. xxxvi. p. 41) compiled from the semi-weekly Atlantic Ice Report, by F. Wyneken, of New York, and from its own observations. The chart shows that the state of the drift ice in April and May was nearly the same as in February and March. Between 48° and 51° W., and north of 42° N., icebergs were frequently met with, but there were very few to the south of this. It is not supposed that the ice will disappear during July, so that vessels cannot yet safely take a more northerly route.

TOWARDS the end of June very remarkable weather prevailed in certain parts of Scandinavia. At Röros, in Central Norway, for instance, it snowed so heavily that sledges might easily have been used. Just before, the weather had been very warm for a long while. In Sweden, on the other hand, several provinces were visited by terrific cyclones, which tore up hundreds of trees by the roots, and unroofed many houses.

AT the annual meeting of the Victoria Institute, to be held at the Society of Arts House on Tuesday, July 19, at 8 o'clock, an address will be delivered by the President of the Royal Society.

THE total value of the fish landed on the coasts of Scotland during the six months ended June 1887 was £556,058, being a decrease under the corresponding period of last year of £38,332, a decrease under the corresponding month of last year of £34,219, and an increase over last month of £9043.

THE additions to the Zoological Society's Gardens during the past week include an Entellus Monkey (*Semnopithecus entellus*, ♀) from India, presented by Capt. W. L. Prentice; a Grey Squirrel (*Sciurus cinereus*) from North America, presented by Mr. Percival Farrer; two Weasels (*Mustela vulgaris* ♂ ♀) from Sussex, presented by Mr. Clement Wykeham Archer; two Blue-headed Pigeons (*Starnœnas cyanocephala*) from Cuba, presented by Mr. John Marshall; two Common Gulls (*Larus canus*) from Scotland, presented by Mr. T. A. Cotton; two Lapwings (*Vanellus vulgaris*) from Essex, presented by Mr. Gervase F. Mathew; an Alligator Terrapin (*Chelydra serpentina*) from North America, presented by Prof. Agassiz; a Speckled Terrapin (*Clemmys guttata*), an American Black Snake (*Coluber constrictor*), from North America, presented by Mr. Samuel Garman; a White-fronted Capuchin (*Cebus albifrons*) from Brazil, a Dingo (*Canis dingo* ♀) from Australia, deposited; two Gluttons (*Gulo luscus*) from Russia, a Redshank (*Totanus calidris*), two Lapwings (*Vanellus vulgaris*) from Suffolk, purchased; a Mandarin Duck (*Æx galericulata*), two Red-crested Pochards (*Fuligula rufina*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

RESEARCHES ON THE DIAMETER OF THE SUN.—In continuation of his investigations on the supposed changes in the sun's diameter from year to year (NATURE, vol. xxxv. p. 496), Prof. Auwers publishes in the *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften zu Berlin*, 1887, No. xxviii., the result of his researches on the yearly inequality of the diameter. The existence of such an inequality has been pointed out by Lindenau in his discussion of Maskelyne's observations; by Cesaris, Carlini, and Rosa in the Milan observations; and by Struve in the Dorpat observations. More recently Rosa has discussed extensive series of Greenwich observations of the sun, and also Madras observations; Newcomb and Holden have discussed Greenwich and Washington observations; and Hilfiker has discussed transits of the sun's diameter obtained at Neuchâtel. To these must now be added Prof. Auwers' careful discussion of the Greenwich transit-circle observations, both of horizontal and vertical diameter, obtained during the years 1851–83 inclusive, as well as of the extensive series of Washington and Oxford observations collected in his former paper, referred to above. These discussions all show the existence of apparent inequalities in the sun's diameter during the year, but do not appear to be at all conclusive as to the reality of such variations in the sun itself. In Prof. Auwers' opinion they are due to the effect of temperature on the instrument, or to the effect of difference in the telescopic image of the sun as observed at opposite seasons of the year. Thus a most remarkable inconsistency appears in the results obtained from the Greenwich observations, both of horizontal